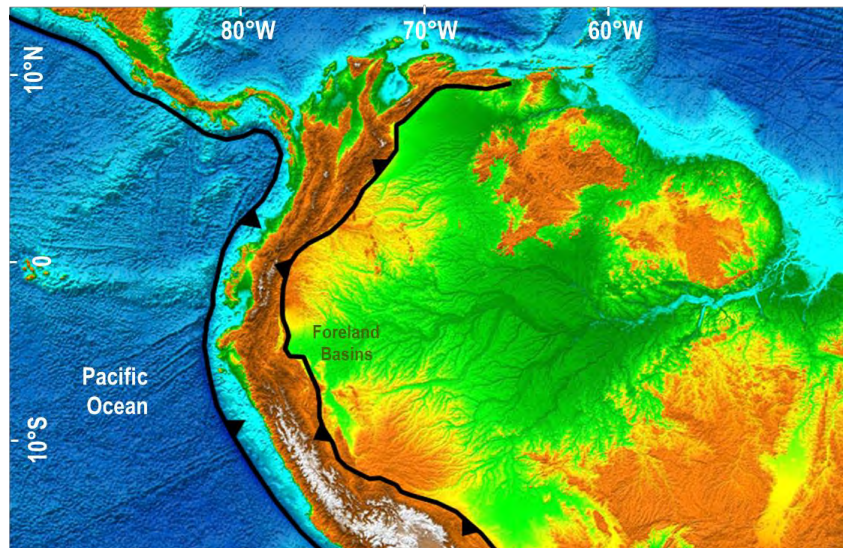


Colombia, An oil and gas country adapts its law to low-carbon energies and *in-situ* resources

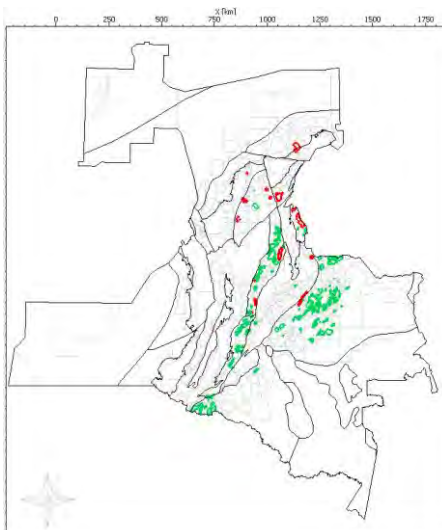
Felipe Gonzalez-Penagos, PhD.
Former Director of Hydrocarbons
Ministry of Mines and Energy of Colombia



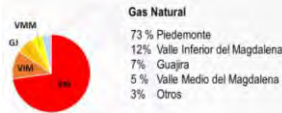
1. Introduction
2. Just Energy Transition
3. Colombian SubSurface
4. Legal Framework



1. Introduction

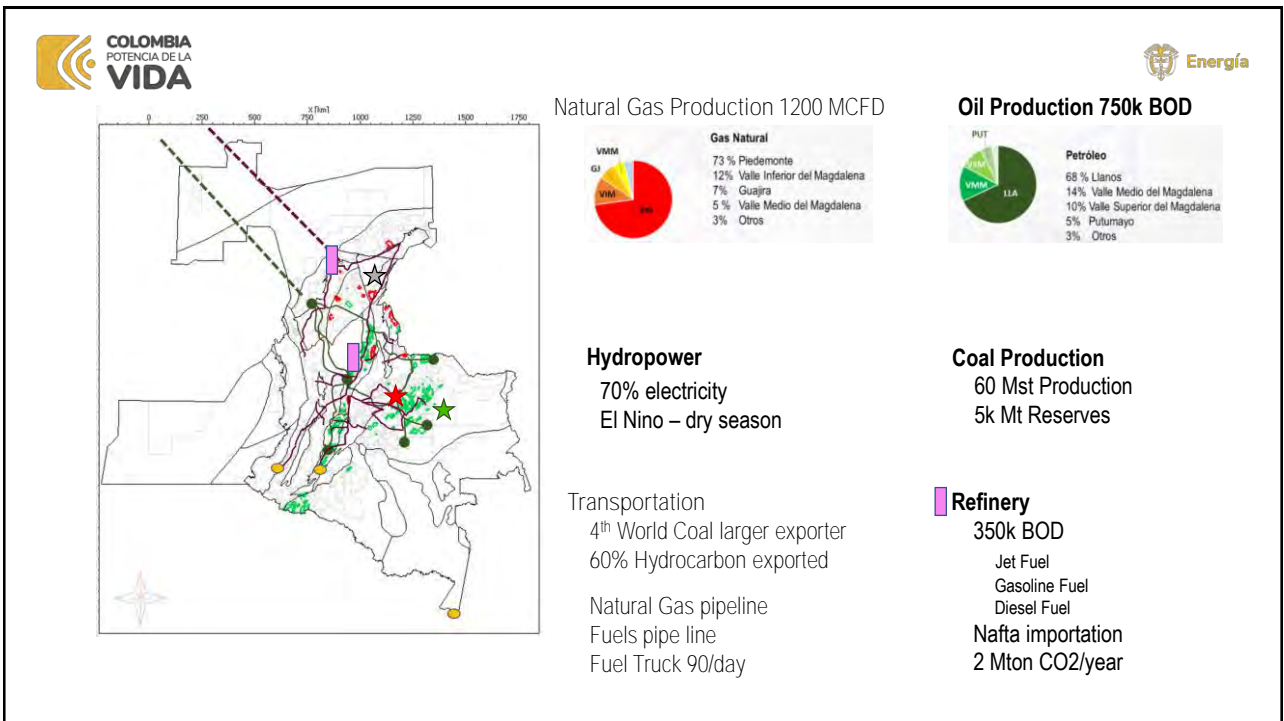
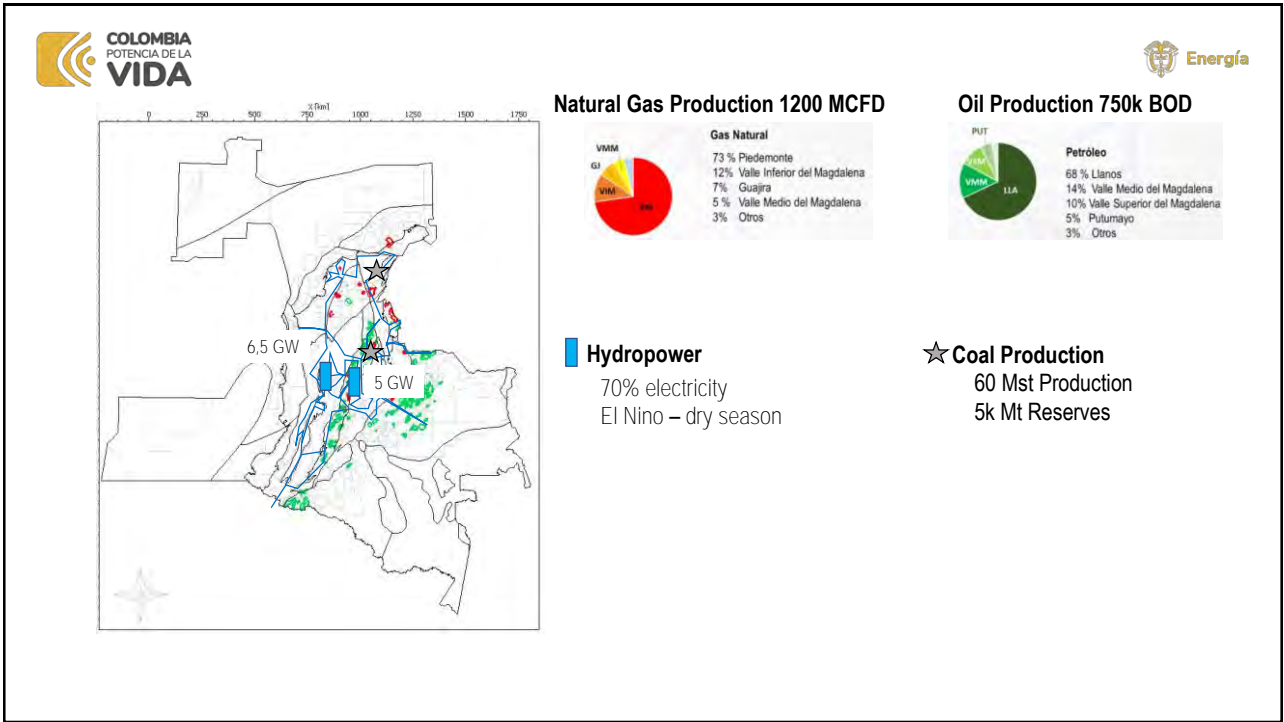


Natural Gas Production 1200 MCFD

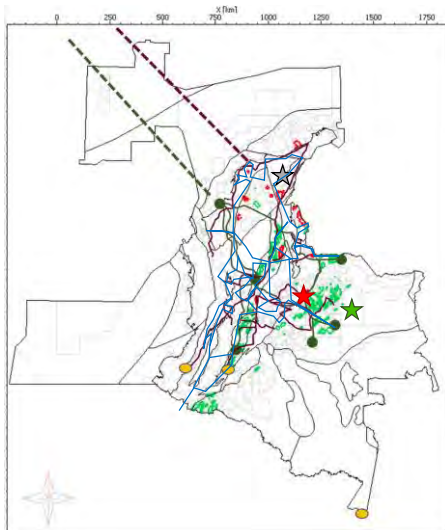


Oil Production 750k BOD





2. Just Energy Transition



Affordable



Tax incentives in the National Development Plan of Colombia 2022-2026

Reliable



Solar panels and wind energy
Transportation efficiency
Strategic storage

sustainable



Low carbon solutions
Wood burning indoor pollution



New Bill



Monthly Natural Gas Bill

Traditions



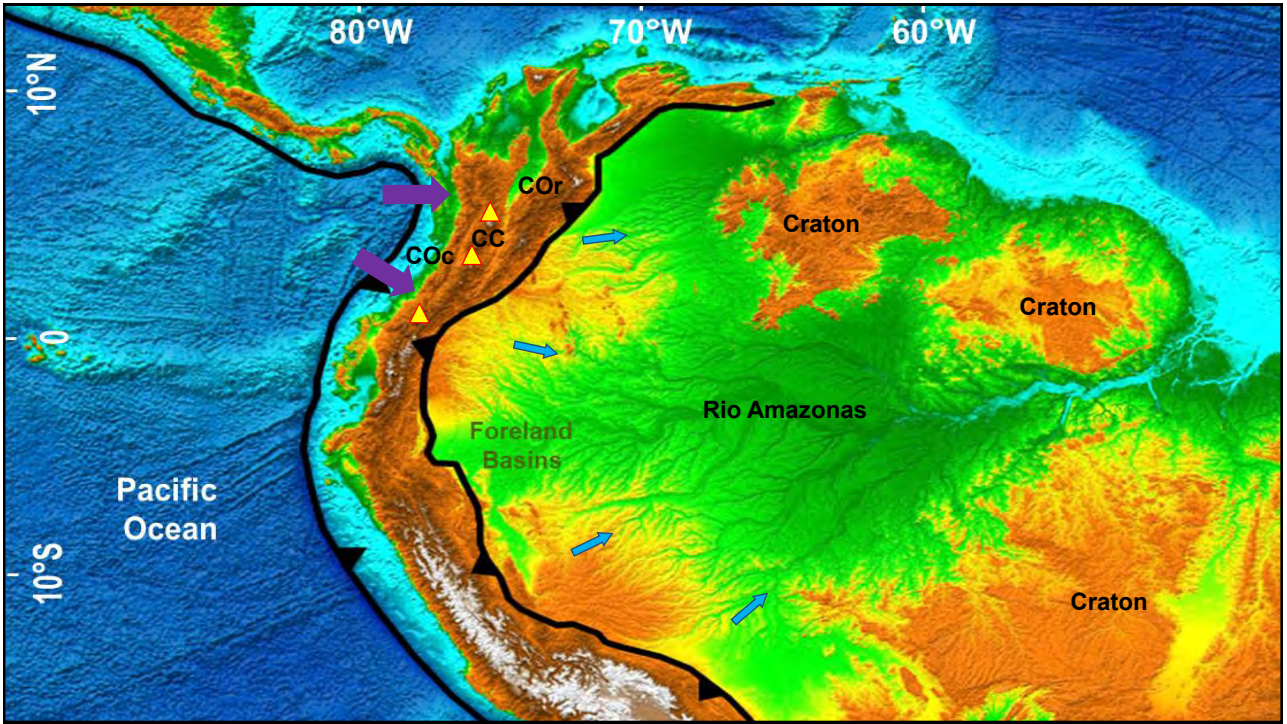
Gasoline engine for fishing and wood burning

Fuels High Cost



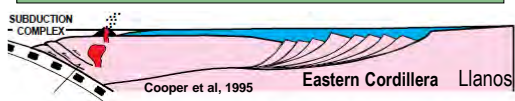
More Fuels and more Subsidies

3. Colombian SubSurface

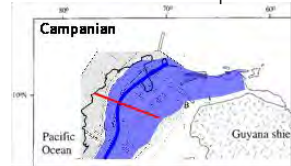


Volcanic Central Cordillera, Western Cordillera Obduction and Eastern Cordillera Uplift

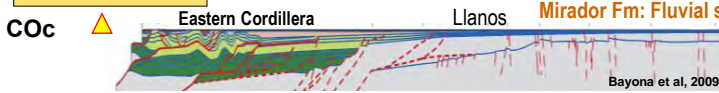
Early Cretaceous – Campanian Back-Arc Subsidence



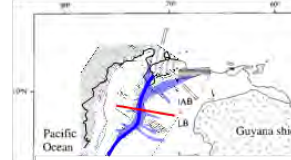
Une Fm: Deltaic system
 Gacheta Fm: Offshore
 Guadalupe Fm: Deltaic system



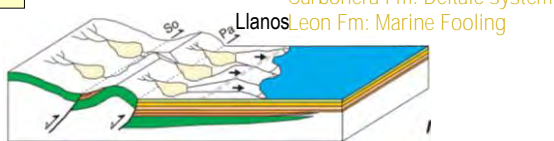
Paleocene - Eocene



Barco Cuervos Fm: deltaic
 Mirador Fm: Fluvial system



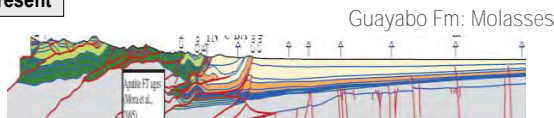
Oligocene - Middle Miocene



Carbonera Fm: Deltaic system
 Leon Fm: Marine Fooling

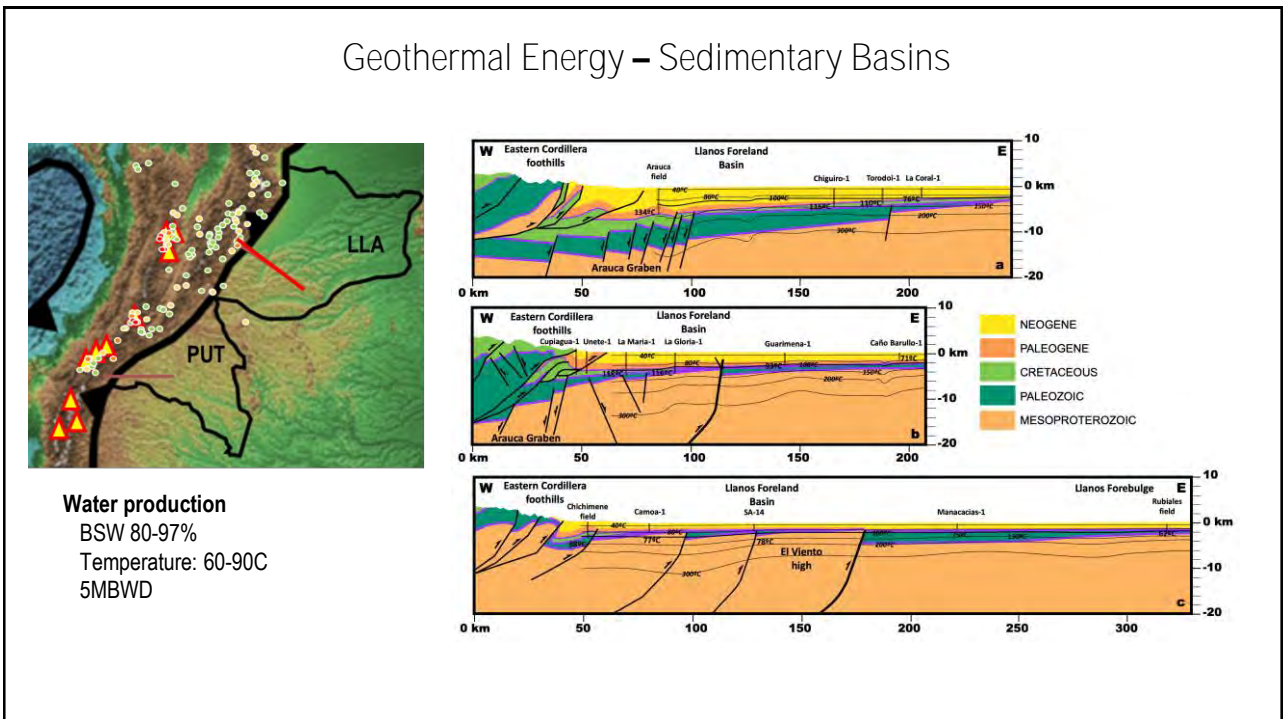
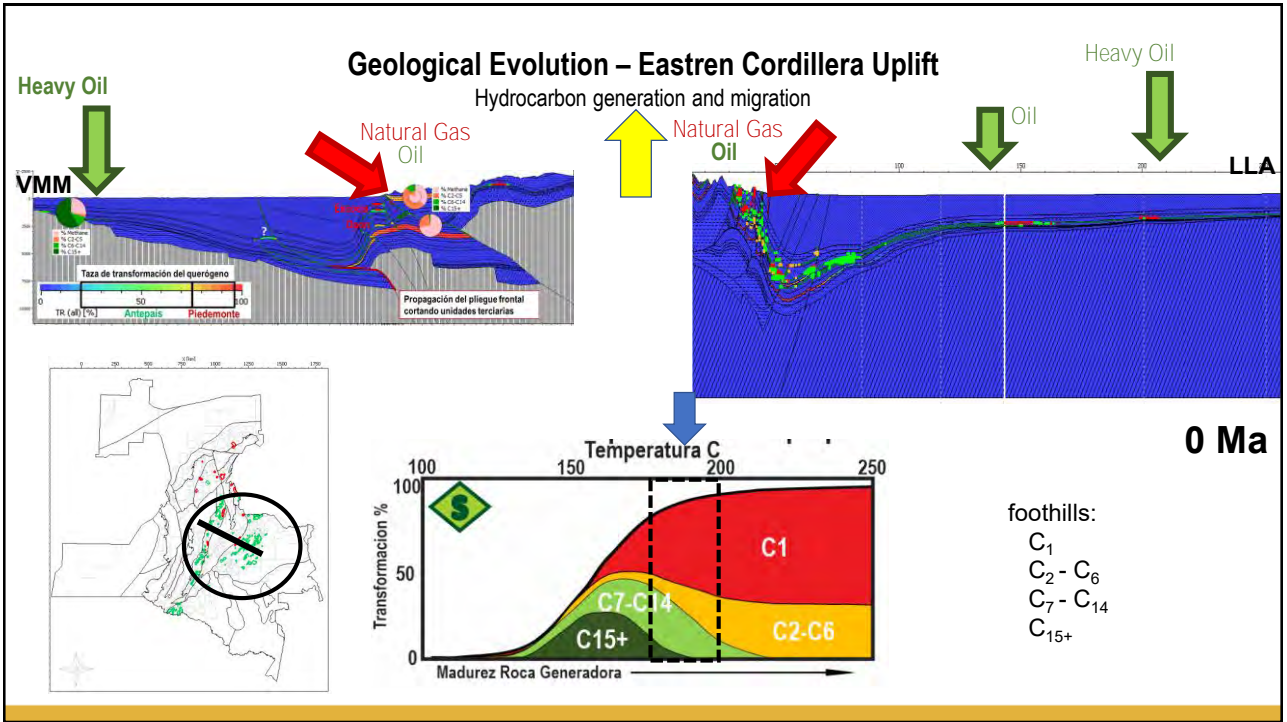


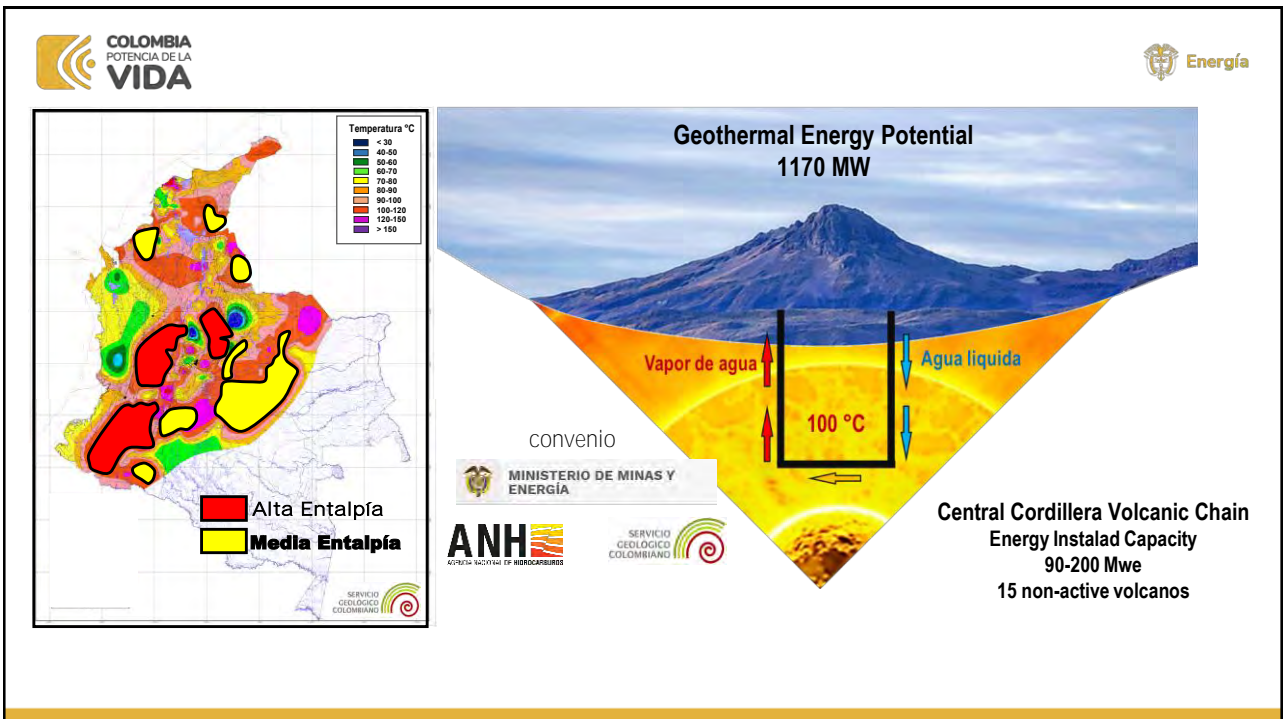
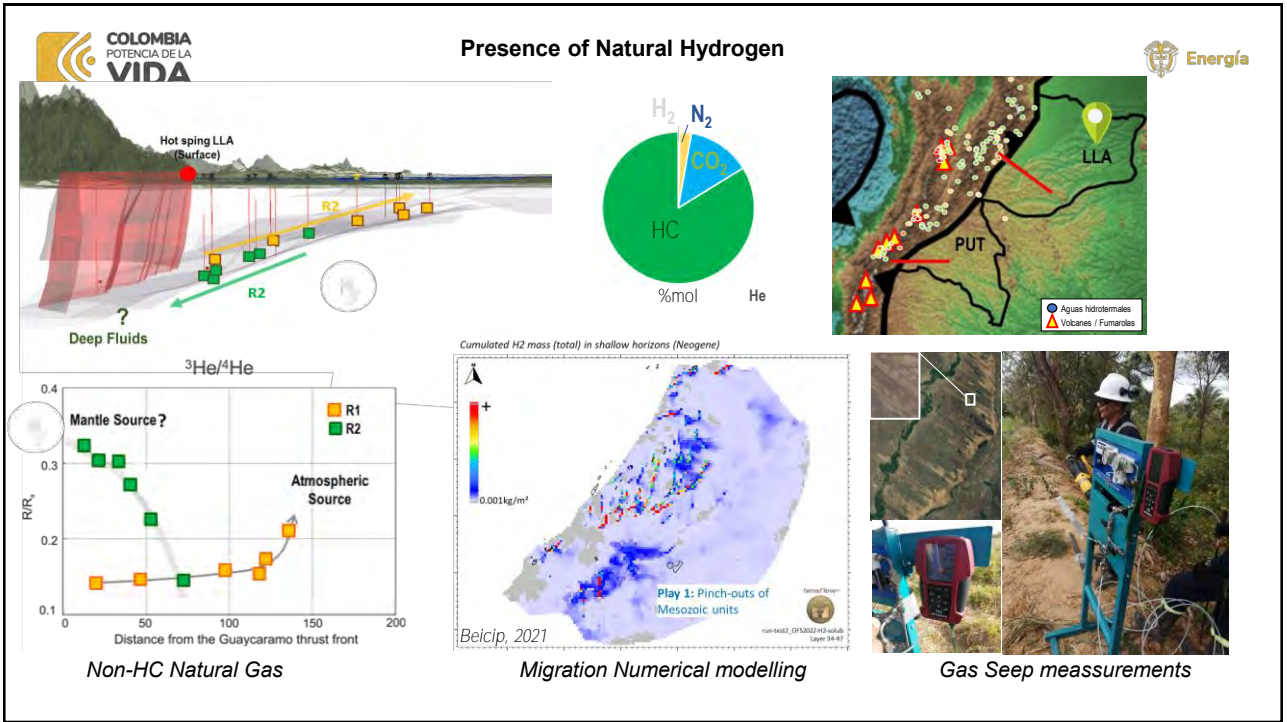
Middle Miocene - Present

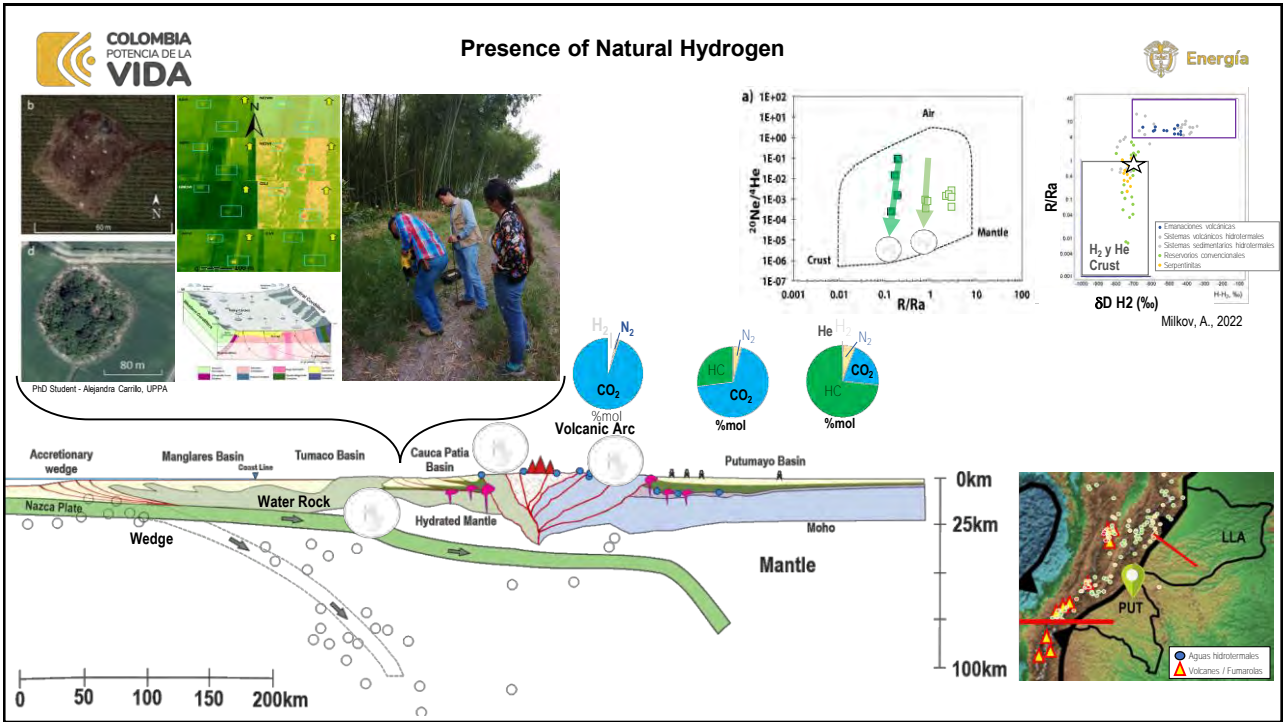


Guayabo Fm: Molasses

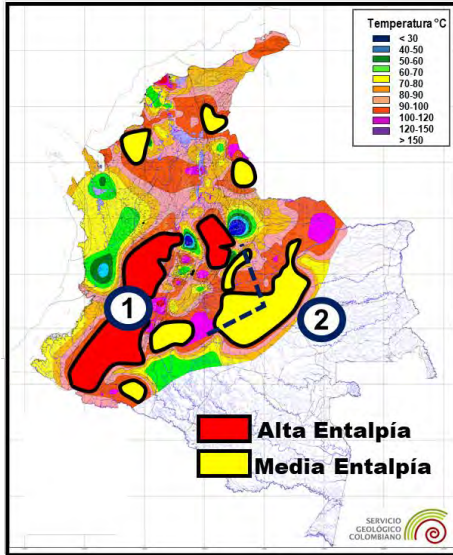








4. Legal Framework



Geothermal Energy

Decreto 1318 de 2022
development of activities aimed at the generation of electrical energy through geothermal energy

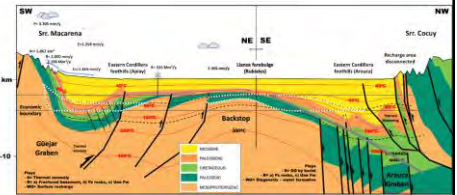


High Enthalpy

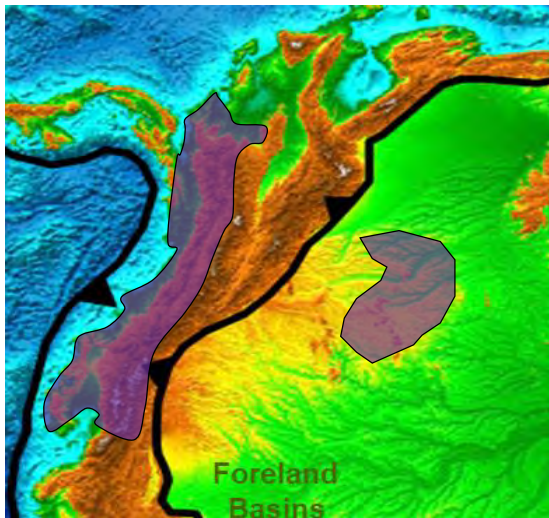


Non-active volcano

Middle-Low Enthalpy



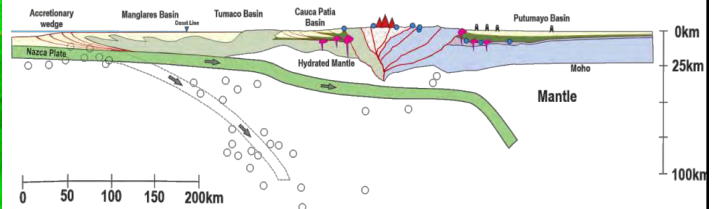
Co-production



artículo 235 de la Ley 2294 de 2023
development of White Hydrogen projects within the framework in Colombia




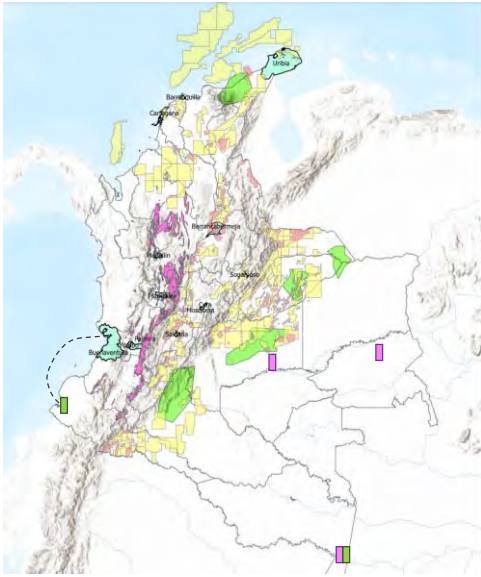
Exploration and Technical Evaluation at regional Scale







Government Integration and New Energy Resources









Arauca




Cerrejon




Chuchupa



Puerto Gaitan





Cerro Bravo





Meta


New Energy Technical and Safety Table



























Natural Resources *in-Situ*

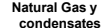


Hydrocarbons

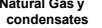
Heavy Oil




Natural Gas y condensates

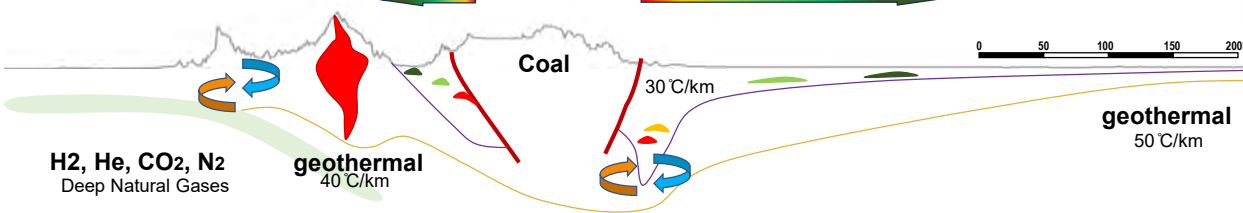


Natural Gas y condensates



Heavy Oil





0 50 100 150 200km

H2, He, CO2, N2
Deep Natural Gases

geothermal
40 C/km

Coal

30 C/km

geothermal
50 C/km

Geothermal energy in off-the-grid zones
 High capacity plant factor
 New in-situ resources
 Low carbon energy
 Short transportation / low price
 Local industry

